

Claims:

1. A particulate water absorbing agent having irregularly pulverized shape, which particulate water absorbing agent comprises a surface crosslinked water-absorbing resin obtained by crosslinking polymerization of an unsaturated monomer having an acid group and/or salts thereof, said particulate water absorbing agent contains agglomerated particles therein, and further said particulate water absorbing agent satisfies (i) to (iii) described below:

(i) centrifuge retention capacity (CRC) of the particulate water absorbing agent in a physiological saline solution being not lower than 32 g/g;

(ii) mass median particle size (D50) of the particulate water absorbing agent being in the range of 200 to 400 μm ; and

(iii) particles of the particulate water absorbing agent smaller than 600 μm and not smaller than 150 μm being in the range of 95 to 100% by weight.

2. A particulate water absorbing agent having irregularly pulverized shape according to claim 1, wherein water content of the particulate water absorbing agent is 1 to 10% by weight.

3. A particulate water absorbing agent having irregularly pulverized shape according to claims 1 or 2, wherein decreased ratio of the mass median particle size of the particulate water absorbing agent caused by impact is 5 to 30%.

4. A particulate water absorbing agent having irregularly pulverized shape according to any one of claims 1 to 3, wherein increased ratio of the mass median particle size of the particulate water absorbing agent due to

agglomeration is 5 to 30%.

5 5. A particulate water absorbing agent having irregularly pulverized shape according to any one of claims 1 to 4, wherein further liquid permeation time under pressure of the particulate water absorbing agent is not longer than 60 seconds.

10 6. A particulate water absorbing agent having irregularly pulverized shape according to any one of claims 1 to 5, wherein further absorbency against pressure at 1.9 kPa of the particulate water absorbing agent in a physiological saline solution is not lower than 20 g/g.

15 7. A particulate water absorbing agent having irregularly pulverized shape according to any one of claims 1 to 6, wherein further vortex water absorption speed of the particulate water absorbing agent in a physiological saline solution is not longer than 60 seconds.

20 8. A particulate water absorbing agent having irregularly pulverized shape according to any one of claims 1 to 7, wherein further fluidity of the particulate water absorbing agent after moisture absorption is 0 to 20% by weight.

25 9. A particulate water absorbing agent having irregularly pulverized shape according to any one of claims 1 to 8, wherein further logarithmic standard deviation of particle size distribution of the particulate water absorbing agent is 0.20 to 0.40.

30 10. A particulate water absorbing agent having irregularly pulverized shape according to any one of claims 1 to 9, wherein further bulk density of gel after saturated swelling of the particulate water absorbing agent in a physiological saline solution is in the range of 0.80 to 1.0 (g/cm³).

11. A particulate water absorbing agent having

irregularly pulverized shape according to any one of claims 1 to 10, which further comprises, besides the water-absorbing resin, one or more component selected from the group consisting of a chelating agent, a deodorant, a polyvalent metal salt and an inorganic fine particle.

12. An absorbing article for excrement, urine or blood, which includes absorbent substrate formed by comprising a particulate water absorbing agent having irregularly pulverized shape according to any one of claims 1 to 11 and hydrophilic fiber.

13. An absorbing substrate according to claim 12, wherein the absorbing substrate is a thin type with thickness of 0.1 to 5 mm.

14. An absorbing substrate according to claims 12 or 13, wherein content of the particulate water absorbing agent having irregularly pulverized shape is 30 to 100% by weight based on total weight of the particulate water absorbing agent and the hydrophilic fiber.

15. A method for production of a particulate water absorbing agent having irregularly pulverized shape, which particulate water absorbing agent comprises a surface crosslinked water-absorbing resin obtained by crosslinking polymerization of an unsaturated monomer having an acid group and/or salts thereof and further via drying and pulverizing steps, and said particulate water absorbing agent contains agglomerated particles therein, which method comprising:

a step of crosslinking polymerization of an aqueous solution of an unsaturated monomer containing a non-neutralized acrylic acid and/or salts thereof in the presence of a crosslinking agent;

a step of further surface crosslinking of a water-absorbing resin particle obtained by the polymerization

and said water absorbing resin particle satisfying (i) to (iii) described below:

(i) centrifuge retention capacity (CRC) of the water-absorbing resin particle in a physiological saline solution being not lower than 32 g/g,

(ii) mass median particle size (D50) of the water-absorbing resin particle being in the range of 150 to 380 μm , and

(iii) the water-absorbing resin particles smaller than 600 μm and not smaller than 150 μm being in the range of 92 to 100% by weight; and

a step of further adding aqueous liquid thereto after the surface crosslinking and heating the resin particles while maintaining water content thereof at 1 to 10% by weight and further controlling particle size.

16. A method for production of a particulate water absorbing agent having irregularly pulverized shape according to claim 15, wherein the step of crosslinking polymerization is conducted in the presence of a chain transfer agent.

17. A method for production of a particulate water absorbing agent having irregularly pulverized shape according to claim 15 or claim 16,

wherein the aqueous solution of the unsaturated monomer containing a non-neutralized acrylic acid in concentration of 10 to 30% by weight is crosslinking polymerized in the presence of a crosslinking agent; and

the obtained resin is neutralized after polymerization.

18. A method for production of a particulate water absorbing agent having irregularly pulverized shape according to any one of claims 15 to 17, which method comprises a step of the addition of a chelating agent at one or more timings selected from the group consisting of (i) during

polymerization, (ii) after the polymerization and before surface crosslinking, (iii) during surface crosslinking, (iv) during agglomeration.

19. A method for production of a particulate water
5 absorbing agent having irregularly pulverized shape according to any one of claims 15 to 18, further comprising a step of recovering and regenerating fine particles of the resin which are excluded from the pulverizing and classifying steps, thereby obtaining a water-absorbing resin particle at yield
10 of not lower than 90% by weight based on weight of feed monomer to be polymerized as solid content equivalent.

20. A method for production of a particulate water
absorbing agent having irregularly pulverized shape according to any one of claims 15 to 19, wherein the water-absorbing
15 resin particles are agglomerated so that shortening ratio of liquid permeation time under pressure is not lower than 10%.

21. A method for production of a particulate water
absorbing agent having irregularly pulverized shape according to any one of claim 15 to 20, further comprising a step of
20 adding and mixing inorganic particles after the agglomeration step.